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United States  
Department of  
Agriculture

Soil  
Conservation  
Service

Spokane,  
Washington



# Washington Water Supply Outlook

January 1, 1986

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W2W37

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# Foreward

## How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are termed reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

## For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. Because of the limited space, snow survey measurements are not published in monthly reports. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado (New Mexico)	2490 West 26th Ave., Denver, CO 80211
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	50 South Virginia Street, Third Floor, Reno, NV 89505
Oregon	1220 Southwest 3rd Ave., 16th Floor, Portland, OR 97204
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82602

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 547, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 98502; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Saskatchewan, and N.W.T. — The Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta, T3C 1A6.

# **Washington Water Supply Outlook**

and

**Federal — State — Private  
Cooperative Snow Surveys**

## **Issued by**

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Chief  
Soil Conservation Service  
Washington, D.C.

## **Released by**

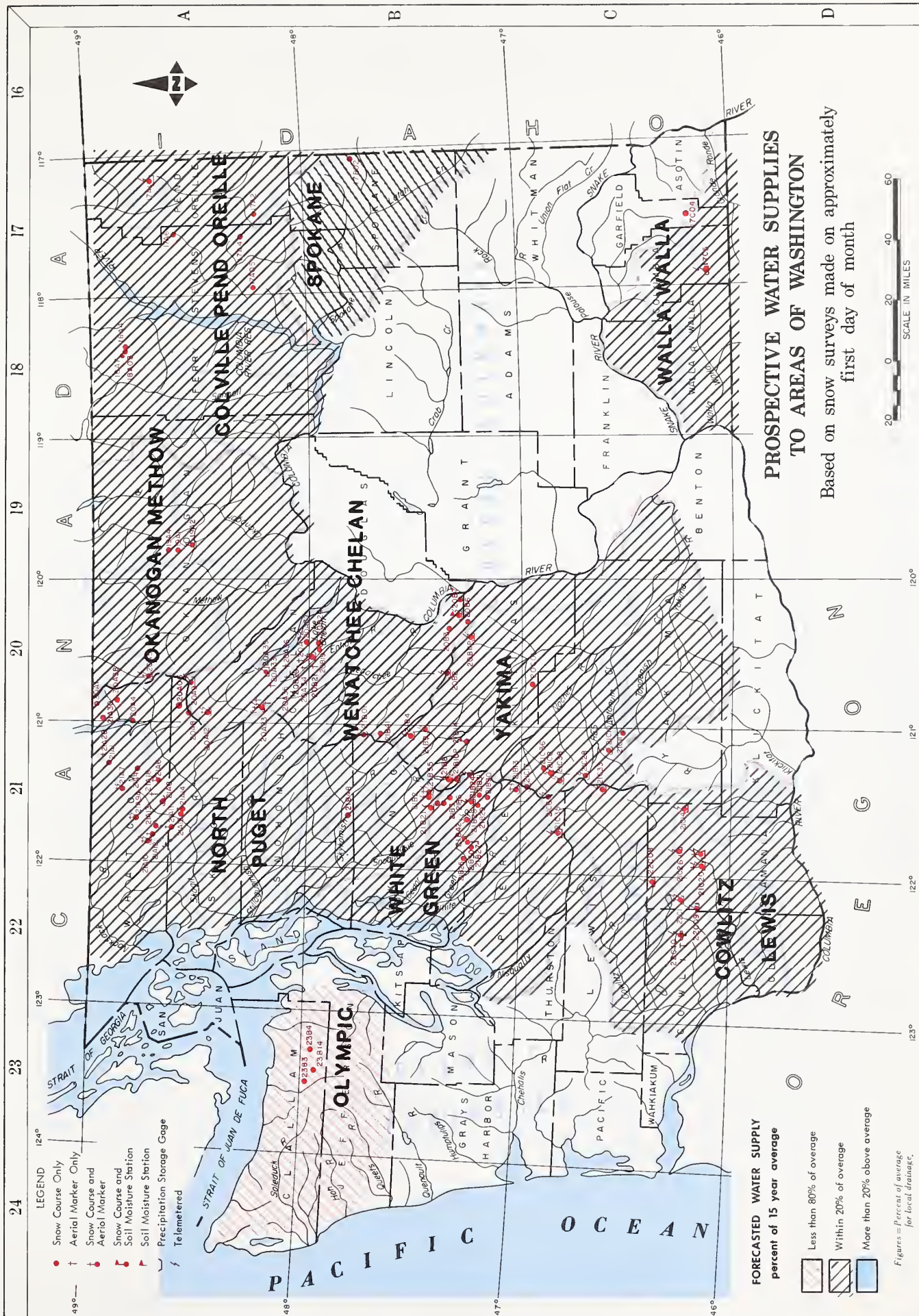
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# INDEX to WASHINGTON SNOW COURSES, SOIL MOISTURE STATIONS and PRECIPITATION STORAGE GAGES

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.	NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
UPPER COLUMBIA DRAINAGE						LOWER COLUMBIA DRAINAGE					
Boyer Mountain	17A2	7	31N	43E	5250	Spruce Springs	17C4	9	8N	40E	5700
Bunchgrass Meadow	17A1SP	24	37N	44E	5000	Touchet No. 2	17C5SP	6	7N	40E	5530
Summit G. S.	18A7	20	39N	35E	4600	June Lake	22C09SP	26	8N	5E	3200
Butte Creek	18A3	28	39N	35E	4070	Lone Pine Shelter	21C26SP	8	9N	7E	3800
Goat Creek	18A4	26	39N	35E	3595	Plains of Abraham	22C1SP	35	9N	5E	4400
Ragged Ridge	17B02	12	27N	45E	3333	Spencer Meadow	21C20SP	16	8N	7E	3400
Baird Stronger Mountain	17A6	19	36N	42E	3215	Surprise Lakes	21C13SP	14	7N	8E	4250
Chewelah	17A5	26	31N	38E	4990	Coyuse Pass	21C6	15	16N	10E	5300
	17A4	11	32N	41E	4925	Pigtail Peak	21C33SP	11	13N	11E	5900
Okonogan River	19A1	30	37N	24E	5700	Paloto Hill	21C14SP	36	10N	10E	4500
Mutton Creek No. 1	19A4	19	37N	24E	6000	Sheep Canyon	22C103P	12	8N	4E	4050
Mutton Creek No. 2	19A2SP	33	37N	24E	4500	Strawberry	22C08SP	9	10N	6E	3280
Salmon Meadows											
Harts Pass	20A5SP	7	37N	18E	6500	PUGET SOUND DRAINAGE					
Chelon Lake Basin	20A23SP	18	31N	16E	5900	Paradise Park (New)	21C35SP	13	15N	8E	5500
Park Creek Ridge	20A12SP	18	34N	16E	4600	Comal Pass	21B13SP	30	18N	11E	6000
Rainy Pass	20A9SP	21	35N	17E	4780	Green River	21B24P	18	20N	11E	1800
Mirror Lake	20A39	30	31N	18E	5600	Alstrip	21B25	27	21N	8E	1200
Brief	20B19	34	28N	19E	1600	Charley Creek	21B42SP	21	21N	9E	3200
Entiat Meadows	20A33a	28	29N	17E	4540	Cougar Mountain	21B27	14	20N	8E	2900
Entiat River Trail	20A30a	17	30N	18E	6510	Grass Mountain No. 2	21B28	12	20N	8E	2100
Fox Camp	20B20	22	29N	18E	3540	Grass Mountain No. 3	21B50	26	20N	10E	3100
Pope Ridge	20B24SP	22	29N	18E	6725	Lester Creek	21B31	5	19N	11E	4700
Pope Ridge Snow Pillow	20A32a	34	30N	18E	6200	Lynn Lake	21B10SP	25	21N	11E	3860
Pugh Ridge	20A37	20	29N	19E	3910	Sawmill Ridge	21B30	18	19N	11E	4100
Shady Pass	20A35a	20	30N	17E	4900	Stampede Pass					
Snow Brushy	20B21a	10	28N	18E	4900	Twin Camp					
Tommy Creek											
Wenatchee River	21B41SP	13	26N	14E	3240	City Cabin	21B3	10	21N	10E	2390
Berne-Mill Creek (New)	20B2SP	35	22N	17E	4270	Mt. Gardner	21B21P	30	22N	10E	3300
Stevens Pass	21B1SP	14	26N	13E	4070	Alpine Meadow	21B48	31	27N	9E	3500
Trough #2	20B25SP	10	20N	20E	5310	Olallie Meadows	21B2P	19	22N	11E	3625
Beehive Springs	20B3	12	21N	19E	4400	Olallie Meadows East	21B55SP	20	22N	11E	3700
Stemilt Slide	20B6	30	21N	20E	5000	Skagit River					
Upper Wheeler	20B7SP	30	21N	20E	4400	Beaver Creek Trail	21A4	35	39N	12E	2200
Ahtanum R. S.	21C11	24	12N	14E	3100	Beaver Pass	21A1	9	39N	12E	3680
Big Boulder Creek	21B9SP	35	23N	14E	3200	Brown Top	21A28a	26	40N	12E	6000
Bumping Lake	21C8P	23	16N	12E	3450	Devils Park	20A4	34	38N	16E	5900
Bumping Lake New	21C36	13	16N	12E	3400	Freezeout Creek Trail	20A1	14	40N	14E	3500
Bumping Ridge	21C38SP	9	15N	12E	4600	Freezeout Meadows (New)	20A38	8	40N	16E	5000
Fish Lake	21B4SP	28	24N	14E	3371	Granite Creek	20A06	25	36N	16E	3500
Green Lake	21C10SP	3	12N	13E	6000	Meadows Cobins	20A8	29	36N	14E	1900
Grouse Camp	20B11SP	29	19E	5385	2200	New Hozomeen Lake	21A30	19	40N	14E	2800
Lake Cle Elum	21B14M	15	20N	11E	5400	Thunder Basin	20A07	10	35N	14E	4200
Morse Lake	21C17SP	6	16N	11E	4400						
Tunnel Avenue	21B8P	13	21N	11E	4500						
White Pass (East Side)	21C28SP	2	13N	11E	4500						

LEGEND  
 21A7 Snow Course Only  
 21A7a Aerial Marker Only  
 21A7b Snow Course And Aerial Marker  
 21A7c Snow Course And Soil Moisture Station  
 21A7d Snow Course And Soil Moisture Station  
 21A7e Snow Course And Soil Moisture Station  
 21A7f Snow Course And Soil Moisture Station  
 21A7g Snow Course And Soil Moisture Station  
 21A7h Snow Course And Soil Moisture Station  
 21A7i Snow Course And Soil Moisture Station  
 21A7j Snow Course And Soil Moisture Station  
 21A7k Snow Course And Soil Moisture Station  
 21A7l Snow Course And Soil Moisture Station  
 21A7m Snow Course And Soil Moisture Station  
 21A7n Snow Course And Soil Moisture Station  
 21A7o Snow Course And Soil Moisture Station  
 21A7p Snow Course And Soil Moisture Station  
 21A7q Snow Course And Soil Moisture Station  
 21A7r Snow Course And Soil Moisture Station  
 21A7s Snow Course And Soil Moisture Station  
 21A7t Snow Course And Soil Moisture Station  
 21A7u Snow Course And Soil Moisture Station  
 21A7v Snow Course And Soil Moisture Station  
 21A7w Snow Course And Soil Moisture Station  
 21A7x Snow Course And Soil Moisture Station  
 21A7y Snow Course And Soil Moisture Station  
 21A7z Snow Course And Soil Moisture Station

## OLYMPIC PENINSULA

Dungeness River	2384	1	28N	5W	5200
Elwho River	2383	36	29N	7W	4500
Hurticane					
Cox Valley	23814	31	29N	6W	4500

## DOCK BUTTE

Dock Butte	21A11A	8	36N	8E	3800
Easy Pass	21A7A	19	39N	11E	5200
Jasper Pass	21A6A	17	38N	11E	5400
Martin Lake	21A9A	23	38N	8E	3600
Mount Blum	21A18a	27	38N	10E	5800
Rocky Creek	21A12AP	20	37N	8E	2100
Schreibers Meadow	21A10AP	18	37N	8E	3400
S. F. Thunder Creek	21A14A	20	36N	9E	2200
Sulphur Creek	21A13	22	37N	8E	1600
Three Mile Creek	21A15	18	36N	9E	1600
Watson Lakes	21A8P	25	37N	9E	4500



## GENERAL OUTLOOK

### SUMMARY:

THE WATER SUPPLY FORECAST FOR WASHINGTON WILL BE PUBLISHED IN JANUARY FOR THE FIRST TIME. THE REPORT IS ALSO BEING PRINTED IN A NEW FORMAT THAT WILL CONFORM WITH WATER SUPPLY FORECASTS WESTWIDE.

### SNOWPACK:

Washington's snowpack is below normal for January 1. Most basins are less than 80% of normal. The Baker River has 52%, the Green River 78%, and the Skykomish River is at 70%. Several areas within the state do not have any snowcourses read this report. Forecasted streamflows are for near normal to below normal flows for the summer.

### PRECIPITATION:

Precipitation has varied greatly by month, with 200% of normal in many areas for October and less than 10% of normal for December in others. Some of the readings for October were 266% for Wenatchee, 204% for Yakima, 229% for North Puget and 151% for the Spokane. December was a reversal of this trend, North Puget Sound had 14%, the Olympics 19%, Colville 20% and the Yakima 33%. Water Year precipitation is now running about 75% of normal statewide.

### RESERVOIRS:

Reservoir storage is below average in the state. Storage within the Yakima River reservoirs is the second lowest in the past ten years. Banks and Roosevelt Lakes are at 71% of average.

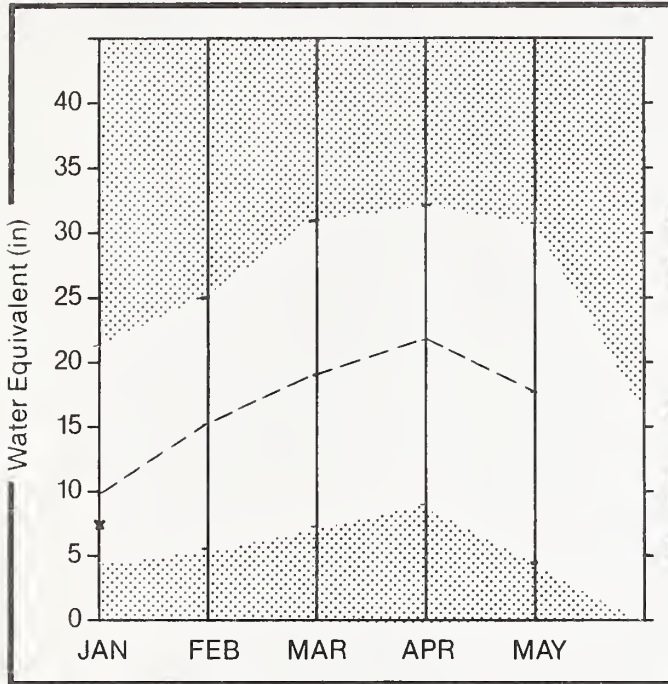
### STREAMFLOW:

December streamflow has been below normal statewide except in the Spokane River where the flow was 101% of normal. Because of ice flows most eastside stream data is unreliable. Westside streams were significantly affected by cold and dry weather. Flows in the Cowlitz were 37% of average, the Chehalis - 42% and the Skykomish at 25%. The Columbia River at the International Boundary was 82% of normal.





# SPOKANE

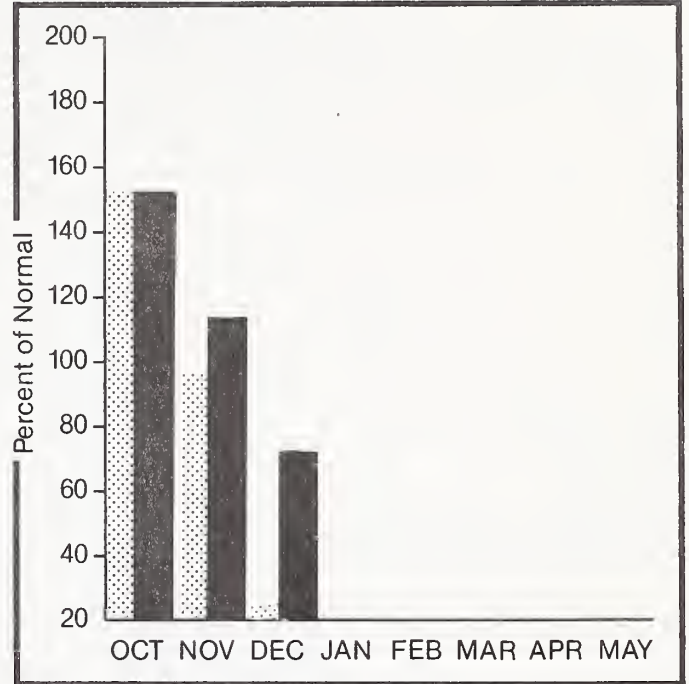
**Mountain snowpack\*** (inches)





\*Based on selected stations

Maximum  Average   
 Minimum  Current 

**Precipitation\*** (percent of normal)



\*Based on selected stations

Monthly precipitation  Year to date precipitation 

## SPOKANE RIVER BASIN

### WATER SUPPLY OUTLOOK:

The forecasted streamflow for the Spokane River is below normal for the spring and summer with 77 percent. December streamflow in the Spokane River was 101% of normal. Snow cover in the 5 courses that were read was at 72% of average, but the snowcover is only 33% of that measured in 1985. Temperatures averaging 10 degrees below normal maintained the snowpack that fell in November. December precipitation was 21% of average while the accumulative water year total is 74% of average. Storage in Coeur d' Alene Lk. is 18%

For more information contact your local Soil Conservation Service office.



# SPOKANE RIVER BASIN

## STREAMFLOW FORECASTS

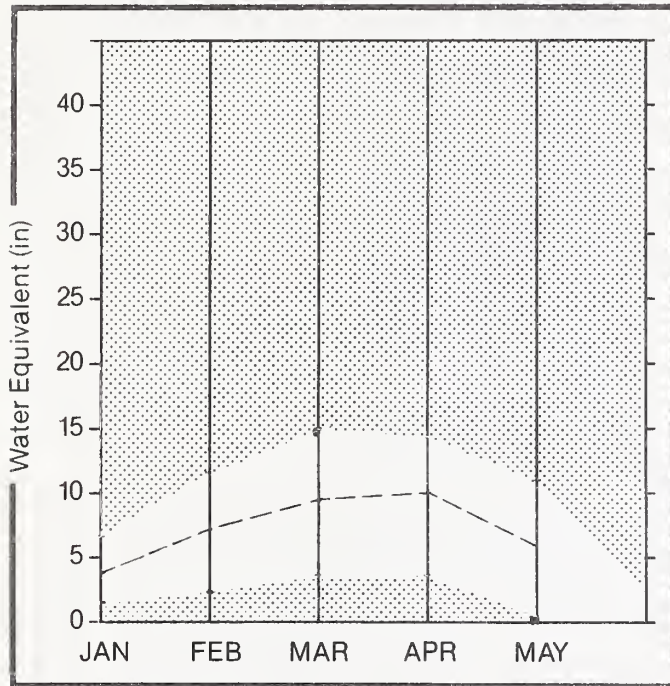
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	HIGH FLOW (CFS)	LOW FLOW (CFS)
SPOKANE at Post Falls	APR-SEP	2848.0	2200.0	77.0	128.2	26.3				
	APR-JUL	2754.0	2130.0	77.0	118.4	26.3				

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE
COEUR D'ALENE	225.1	25.5	49.9	142.6	Spokane River	10	35 71

\*Corrected for upstream diversions or changes in reservoir storage.  
Average is for 1961-80 period.

# COLVILLE AND PEND OREILLE

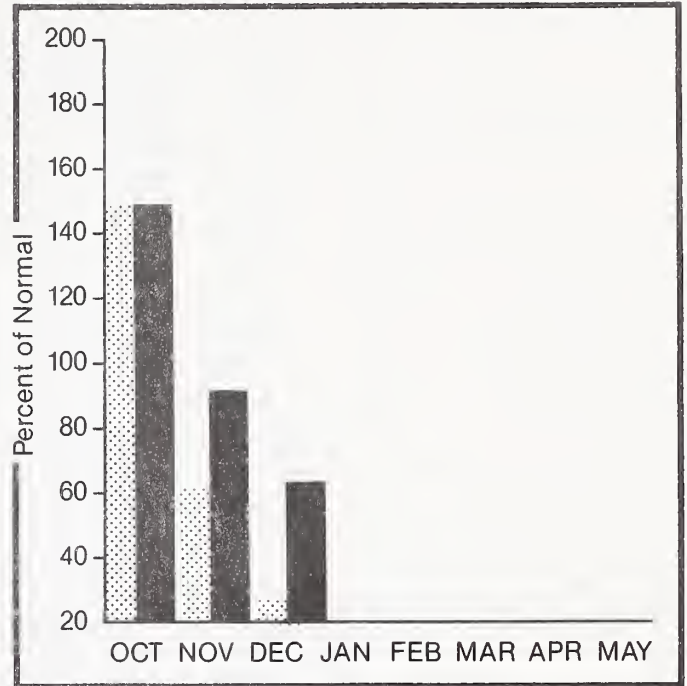
Mountain snowpack\* (inches)



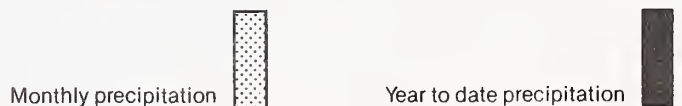
\*Based on selected stations



Precipitation\* (percent of normal)



\*Based on selected stations



## COLVILLE - PEND OREILLE RIVER BASINS

### WATER SUPPLY OUTLOOK:

Cold and dry has been the norm for weather in the Colville - Pend Oreille River Basins. November-December temperatures averaged 12 degrees below normal. December precipitation was at 27% of average with an accumulated water year of 63% of average. The Pend Oreille River flow for December was at 82% of normal. Snow pack for eight courses reporting in the Pend Oreille Basin was at 72% of average. Forecasted streamflow for the basin is near average with 87 percent.

For more information contact your local Soil Conservation Service office.

# COLVILLE - PEND OREILLE RIVER BASINS

## STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
PEND OREILLE RIVER bl Box Canyon	APR-SEP	15425.0	13400.0	86.0	112.9	60.9				
	APR-JUL	14156.0	12300.0	86.0	112.9	60.9				
	APR-JUN	12227.0	10640.0	87.0	113.0	61.0				
COLVILLE RIVER at Kettle Falls	APR-SEP	134.0	127.0	94.0	144.8	44.8				
	APR-JUL	123.0	116.0	94.0	144.7	44.7				
	APR-JUN	114.0	108.0	94.0	144.7	44.7				
KETTLE RIVER nr Laurier	APR-SEP	1829.0	1740.0	95.0	140.1	50.1				
	APR-JUL	1738.0	1650.0	94.0	139.9	49.9				
	APR-JUN	1581.0	1500.0	94.0	139.8	49.8				
COLUMBIA RIVER at Birchbank *	APR-SEP	44605.0	41700.0	93.0	113.5	71.5				
	APR-JUL	35705.0	33400.0	93.0	115.5	71.5				
	APR-JUN	26027.0	24470.0	94.0	116.0	72.0				
COLUMBIA RIVER at Grand Coulee *	APR-SEP	66841.0	60500.0	90.0	112.5	68.5				
	APR-JUL	56169.0	50900.0	90.0	112.6	68.6				
	APR-JUN	44036.0	40070.0	90.0	113.0	69.0				

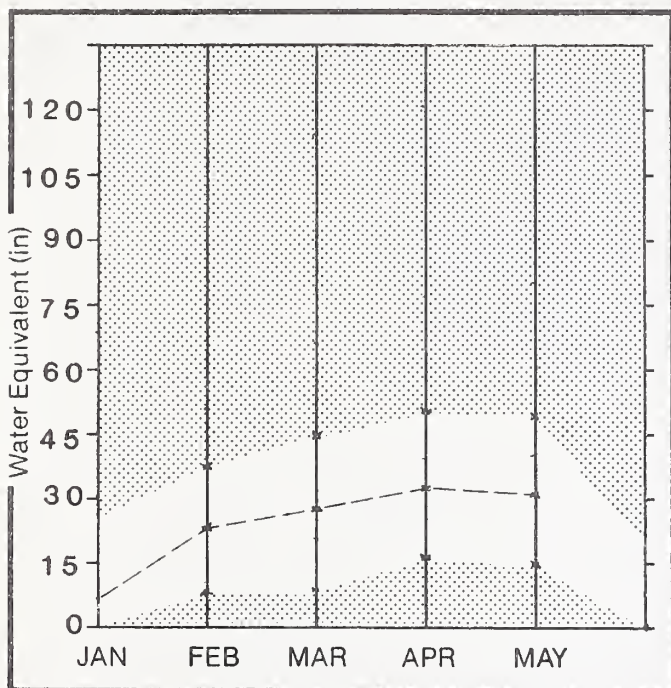
RESERVOIR STORAGE					(1000AF)	WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** THIS YEAR	USEABLE STORAGE	LAST YEAR	** AVE.	WATERSHED	NO. COURSES AVE.0	THIS YEAR AS % OF LAST YR.	AVERAGE
ROOSEVELT	5232.0	3293.0	4889.5	4547.9		Colville River	0	0	0
BANKS	715.0	391.0	672.2	618.3		Pend Oreille River	10	40	70
						Kettle River	0	0	0
						Omac Lake, Twin Lakes	0	0	0
						Newman Lake	0	0	0

\*Corrected for upstream diversions or changes in reservoir storage.  
Average is for 1961-80 period.



# OKANOGAN AND METHOW

Mountain snowpack\* (inches)



\*Based on selected stations

Maximum



Average



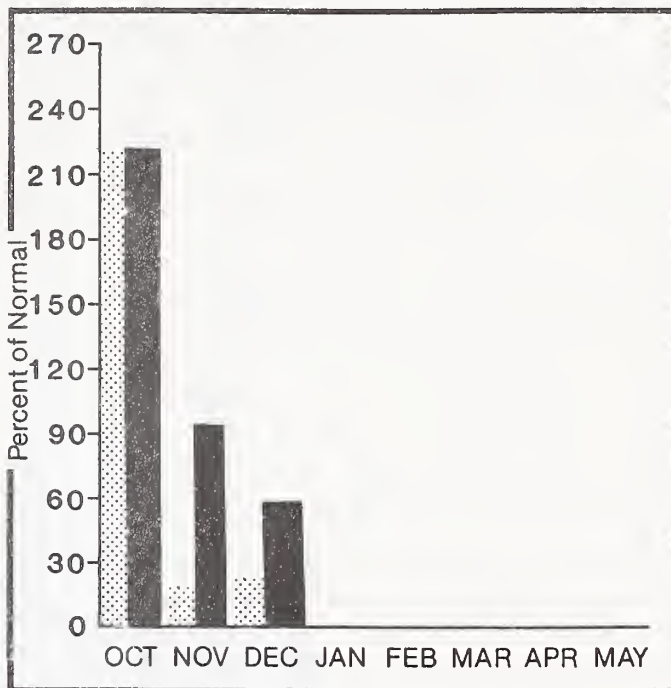
Minimum



Current



Precipitation\* (percent of normal)

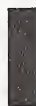


\*Based on selected stations

Monthly precipitation



Year to date precipitation



## OKANOGAN - METHOW RIVER BASINS

### WATER SUPPLY OUTLOOK:

Snowpack in the Okanogan-Methow Basins is 76% of average for the January 1 snow surveys. The cold dry trend in the weather has affected the snowpack and streamflows resulting in below average readings. December precipitation was 22% of normal. Reservoir storage is at 101% of the current 20 year average. Forecasted streamflow for the watersheds calls for near normal runoff for the spring and summer months. The Okanogan River is forecasted at 82%, with the Methow River at 85% of average.

For more information contact your local Soil Conservation Service office.

# OKANOGAN - METHOW RIVER BASINS

## STREAMFLOW FORECASTS

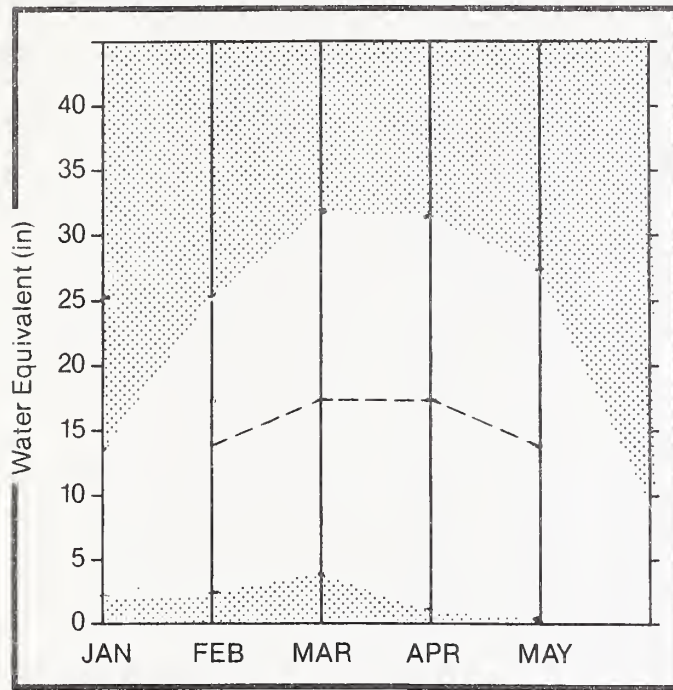
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SIMILKAMEEN R. nr Nighthawk	APR-SEP	1462.0	1200.0	82.0	154.1	10.1				
	APR-JUL	1365.0	1120.0	82.0	154.1	10.0				
	APR-JUN	1161.0	950.0	81.0	153.8	9.8				
OKANOGAN R. nr Tonasket	APR-SEP	1644.0	1310.0	79.0	152.7	6.7				
	APR-JUL	1497.0	1190.0	79.0	152.3	6.5				
	APR-JUN	1262.0	1010.0	80.0	153.0	7.1				
METHOW RIVER nr Pateros	APR-SEP	980.0	833.0	85.0	119.0	51.0				
	APR-JUL	908.0	772.0	85.0	119.1	51.0				
	APR-JUN	773.0	657.0	84.0	119.0	51.0				

RESERVOIR STORAGE					(1000AF)	WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE	CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF	
	THIS YEAR		LAST YEAR	AVE.	LAST YR.			AVERAGE	
						Okanogan River	10	62	76
						Methow River	2	51	67

\*Corrected for upstream diversions or changes in reservoir storage.  
Average is for 1961-80 period.



# WENATCHEE AND CHELAN

Mountain snowpack\* (inches)

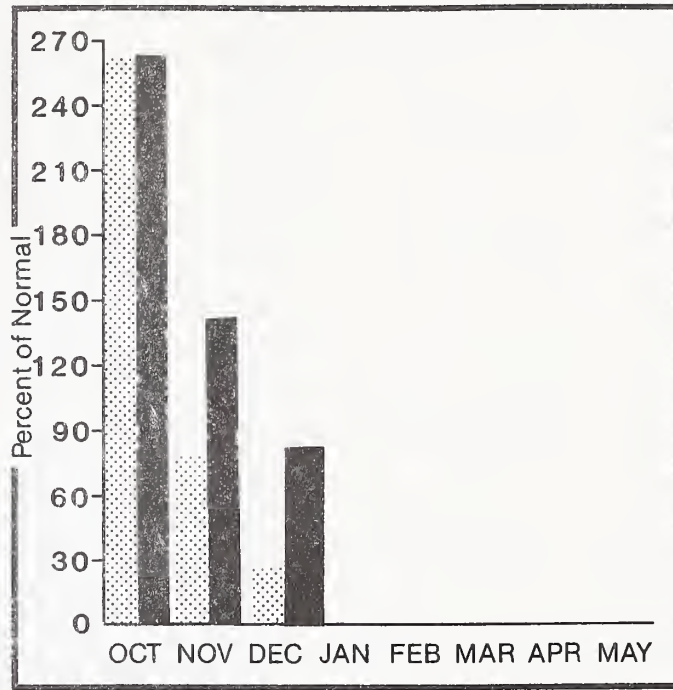


\*Based on selected stations


Maximum   
Minimum 


Average   
Current 

Precipitation\* (percent of normal)



\*Based on selected stations

Monthly precipitation 

Year to date precipitation 

## WENATCHEE - CHELAN RIVER BASINS

### WATER SUPPLY OUTLOOK:

The Wenatchee - Chelan Basins have 74% and 73% of snow cover at the January 1 readings. December streamflow was below average with ice fouling the stream gages. Precipitation for December was 25% of normal bringing the water year total to 84% of normal. Inflows to Lake Chelan for December were below normal due to the cold dry weather. Temperatures averaged 10 degrees below normal for November and December. Streamflows for summer will be near normal with Wenatchee at 91% and Chelan 85%.

For more information contact your local Soil Conservation Service office.



# WENATCHEE - CHELAN RIVER BASINS

## STREAMFLOW FORECASTS

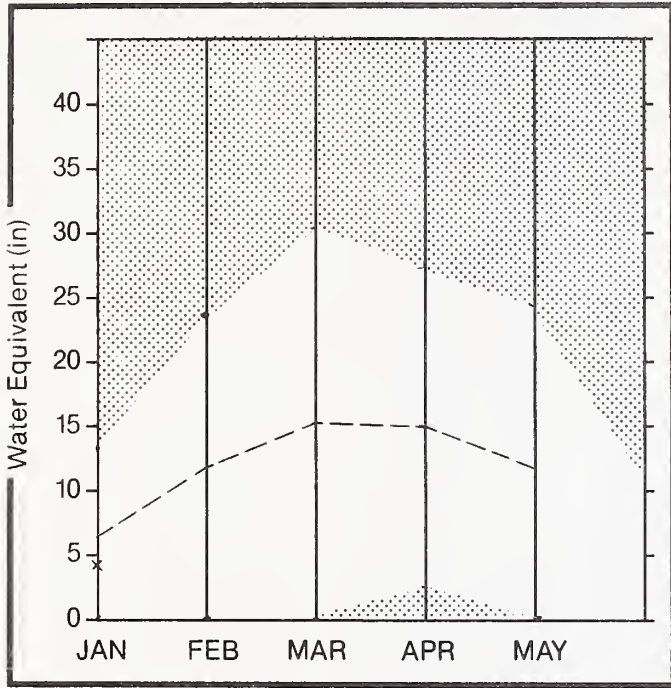
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
CHELAN RIVER at Chelan *	APR-SEP	1203.0	1020.0	84.0	113.8	55.8				
	APR-JUL	1055.0	896.0	84.0	113.9	55.9				
	APR-JUN	826.0	702.0	84.0	114.0	55.9				
STEHEKIN R. at Stehekin	APR-SEP	860.0	817.0	95.0	120.0	70.0				
	APR-JUL	727.0	691.0	95.0	120.1	70.0				
	APR-JUN	553.0	525.0	94.0	119.9	70.0				
ENTIAT RIVER nr Ardenvoir	APR-SEP	234.6	211.0	89.0	89.9	89.9				
	APR-JUL	213.0	191.0	89.0	89.7	89.7				
	APR-JUN	172.0	155.0	90.0	90.1	90.1				
WENATCHEE RIVER at Plain	APR-SEP	1270.0	1160.0	91.0	127.3	55.4				
	APR-JUL	1113.0	1010.0	90.0	126.8	54.7				
	APR-JUN	899.0	820.0	91.0	127.3	55.2				
STEMILT nr Wenatchee (miners in)	MAY-SEP	138.0	126.0	91.0	91.3	91.3				
ICICLE CREEK nr Leavenworth	APR-SEP	370.0	333.0	90.0	90.0	90.0				
	APR-JUL	340.0	306.0	90.0	90.0	90.0				
	APR-JUN	270.0	243.0	90.0	90.0	90.0				
COLUMBIA R. bl Rock Island Dam *	APR-SEP	72781.0	66200.0	90.0	115.0	67.0				
	APR-JUL	61601.0	56100.0	91.0	115.1	67.1				
	APR-JUN	48384.0	44000.0	90.0	114.9	66.9				

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **	THIS YEAR	LAST YEAR	AVE.	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE
CHELAN LAKE	676.1	365.7	---	378.7		Chelan Lake Basin	4	56 73
						Entiat River	0	0 0
						Wenatchee River	5	53 73
						Colockum Creek	1	120 113
						Squilchuck Creek	0	0 0
						Stemilt Creek	0	0 0


\*Corrected for upstream diversions or changes in reservoir storage.  
Average is for 1961-80 period.

# YAKIMA

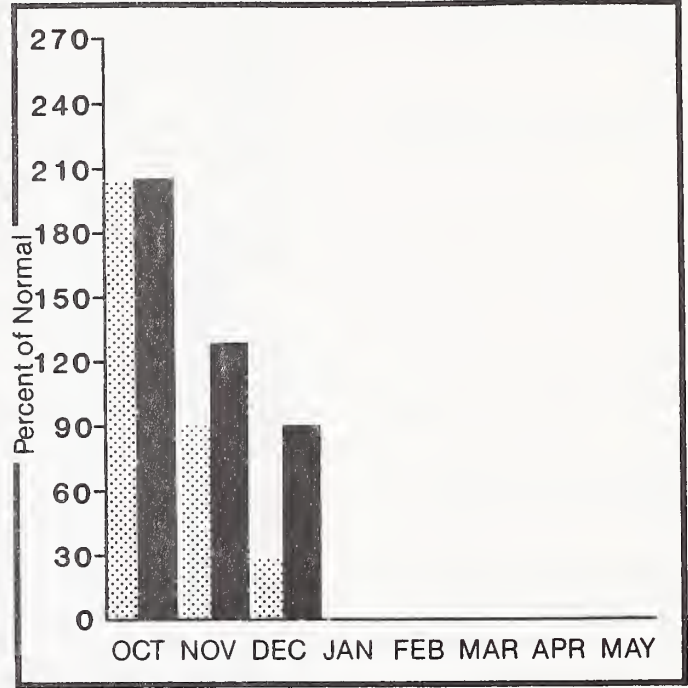
Mountain snowpack\* (inches)





\*Based on selected stations

Maximum  Average   
 Minimum  Current 

Precipitation\* (percent of normal)



\*Based on selected stations

Monthly precipitation  Year to date precipitation 

## YAKIMA RIVER BASIN

### WATER SUPPLY OUTLOOK:

Yakima River snow cover is 76% of normal with 13 of 28 snow courses being read for the January 1 report. Reservoir storage is 72% of normal with the reservoirs holding 403-thousand acre feet. December precipitation was 27% of average bringing the water year total down to 80% of normal. Below average temperature for November and December kept the streamflow low and caused icing problems at the gages. Forecasted flows for spring and summer are for near normal with the Yakima at 85%.

For more information contact your local Soil Conservation Service office.

# YAKIMA RIVER BASIN

## STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAF MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
YAKIMA RIVER at Martin *	APR-SEP	139.0	118.0	84.0	100.7	69.1				
	APR-JUL	128.0	108.0	84.0	100.0	68.7				
	APR-JUN	111.0	94.0	84.0	100.9	68.5				
YAKIMA RIVER at Cle Elum *	APR-SEP	943.0	754.0	79.0	96.0	63.9				
	APR-JUL	854.0	683.0	79.0	96.0	63.9				
	APR-JUN	734.0	587.0	79.0	95.9	64.0				
YAKIMA RIVER nr Parker *	APR-SEP	2096.0	1800.0	85.0	112.9	58.9				
	APR-JUL	1898.0	1630.0	85.0	112.9	58.9				
	APR-JUN	1667.0	1430.0	85.0	112.8	58.8				
KACHESS RIVER nr Easton *	APR-SEP	121.0	99.0	81.0	99.2	64.5				
	APR-JUL	115.0	94.0	81.0	99.1	64.3				
	APR-JUN	101.0	83.0	82.0	99.0	65.3				
CLE ELUM RIVER nr Roslyn *	APR-SEP	463.0	384.0	82.0	97.8	68.0				
	APR-JUL	422.0	350.0	82.0	97.9	68.0				
	APR-JUN	353.0	293.0	83.0	98.0	68.0				
BUMPING RIVER nr Nile *	APR-SEP	142.0	122.0	85.0	114.8	57.0				
	APR-JUL	129.0	111.0	86.0	114.7	57.4				
	APR-JUN	107.0	92.0	85.0	115.0	57.0				
AMERICAN RIVER nr Nile	APR-SEP	124.0	99.0	79.0	109.7	50.0				
	APR-JUL	113.0	90.0	79.0	109.7	49.6				
	APR-JUN	94.0	75.0	79.0	109.4	50.0				
TIETON RIVER at Tieton *	APR-SEP	246.0	197.0	80.0	110.2	50.0				
	APR-JUL	207.0	166.0	80.0	110.1	50.2				
	APR-JUN	165.0	132.0	80.0	110.3	50.3				
NACHES RIVER nr Naches *	APR-SEP	867.0	736.0	84.0	116.8	52.9				
	APR-JUL	784.0	666.0	84.0	117.0	52.9				
	APR-JUN	667.0	567.0	85.0	116.9	53.1				
AHUANUM CREEK nr Tappan *	APR-SEP	47.0	34.0	72.0	117.0	27.7				
	APR-JUL	43.0	31.0	72.0	116.3	27.9				
	APR-JUN	37.0	27.0	72.0	118.9	27.0				

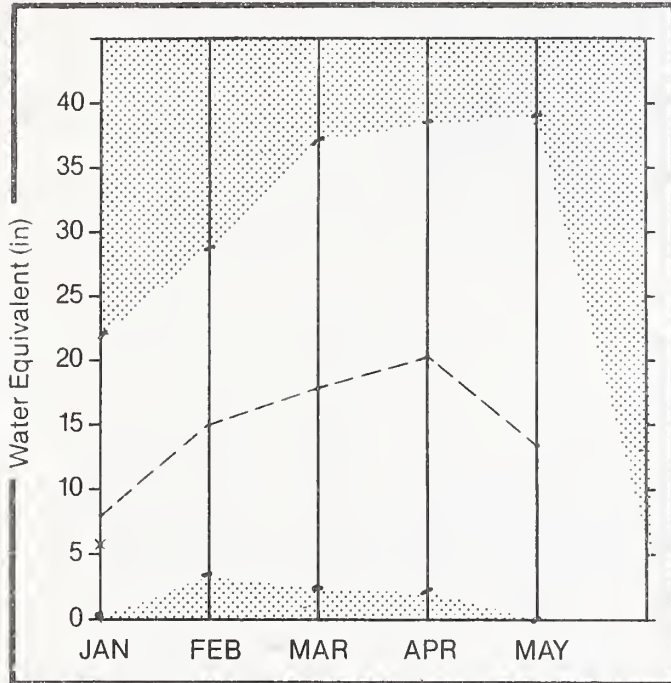
RESERVOIR STORAGE		(1000AF)			WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE	
		THIS YEAR	LAST YEAR	AVE.			LAST YR.	AVERAGE
KEECHULUS	157.8	59.2	84.2	83.0	Yakima River	11	65	75
KACHESS	239.0	98.1	145.0	159.1	Ahtanum Creek	2	89	82
CLE ELEM	436.9	118.5	174.4	230.2				
BUMPING LAKE	33.7	4.3	3.8	4.3				
RIMROCK	198.0	118.8	99.6	102.1				

\*Corrected for upstream diversions or changes in reservoir storage.  
Average is for 1961-80 period.




# WALLA WALLA

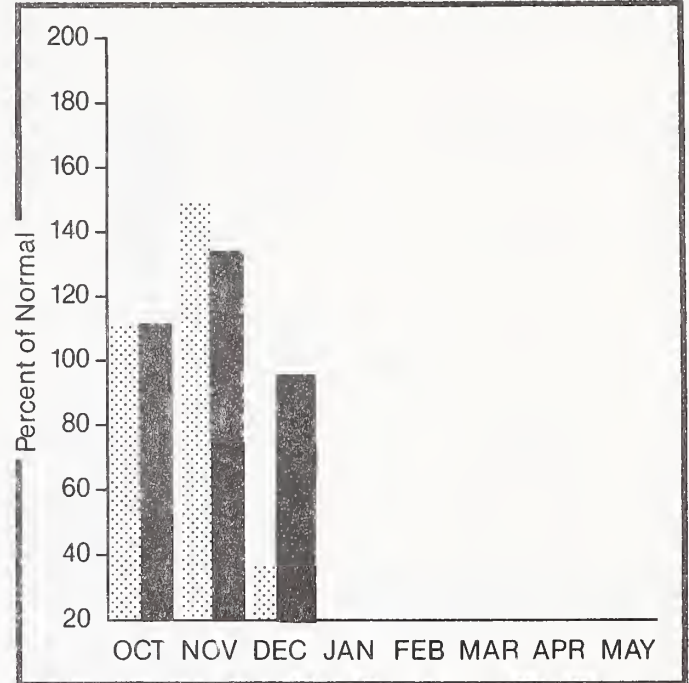
Mountain snowpack\* (inches)



\*Based on selected stations

Maximum  Average   
Minimum  Current 

Precipitation\* (percent of normal)



\*Based on selected stations

Monthly precipitation  Year to date precipitation 

## WALLA WALLA RIVER BASIN

### WATER SUPPLY OUTLOOK:

Streamflows for the Walla Walla Basin are expected to be near average for the spring and summer months. Precipitation was down to 37% of normal for December, but water year precipitation is at 94% of average. Snow cover for the area for January 1 was % of normal. Streamflow in the Basin was below average primarily due to the cold weather and icing of the streams. forecasted streamflows in the Walla Walla area are for 90% of average.

For more information contact your local Soil Conservation Service office.

# WALLA WALLA RIVER BASIN

## STREAMFLOW FORECASTS

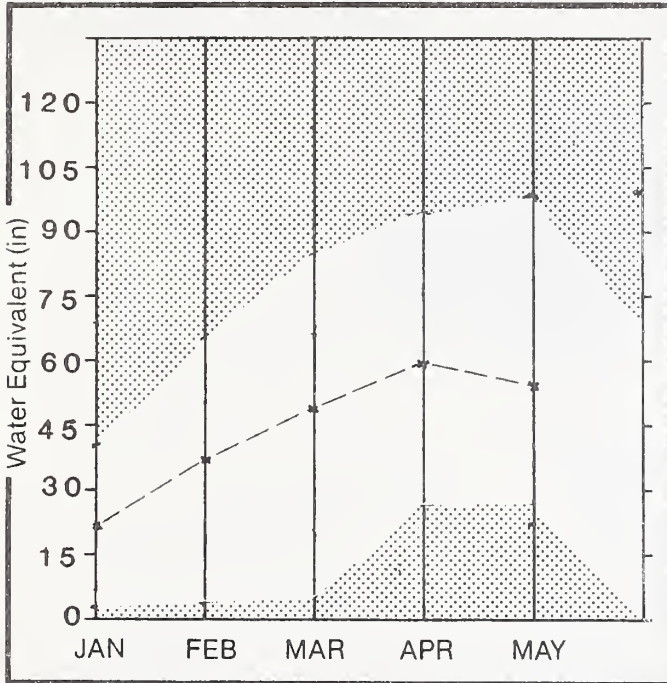
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
MILL CREEK at Walla Walla	APR-SEP	17.5	15.8	90.0	91.4	91.4				
	APR-JUL	17.3	15.6	90.0	92.3	92.3				
	APR-JUN	17.1	15.4	89.0	87.5	87.5				
COLUMBIA R. at The Dalles *	APR-SEP	101000.0	91500.0	90.0	116.6	64.6				
	APR-JUL	86500.0	78300.0	90.0	116.5	64.5				
	APR-JUN	70100.0	63800.0	91.0	117.0	65.0				

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE
		THIS YEAR	LAST YEAR	AVE.			
					Mill Creek	1	23 67

\*Corrected for upstream diversions or changes in reservoir storage.  
Average is for 1961-80 period.

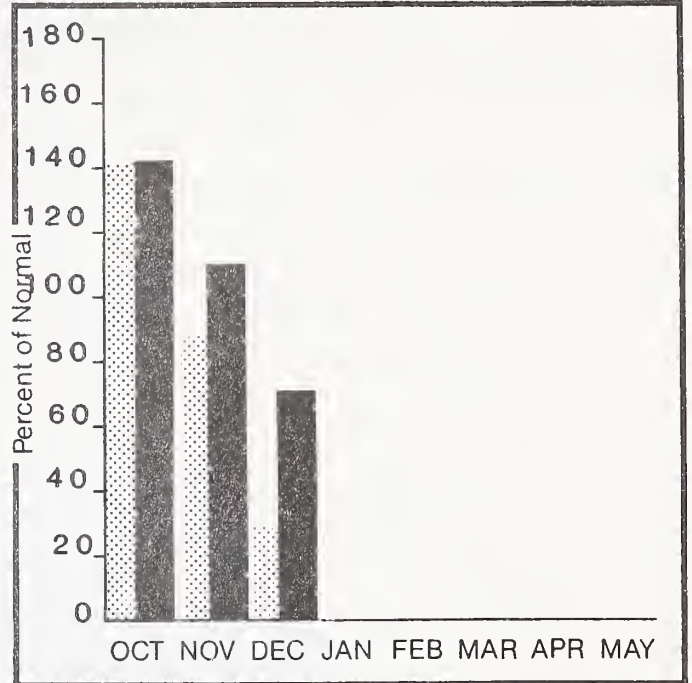
# COWLITZ AND LEWIS

Mountain snowpack\* (inches)



\*Based on selected stations

Precipitation\* (percent of normal)



\*Based on selected stations

Maximum



Average



Minimum



Current



Monthly precipitation



Year to date precipitation



## COWLITZ - LEWIS RIVER BASINS

### WATER SUPPLY OUTLOOK:

Snow cover for the Cowlitz - Lewis Basin is at 63% of average. Streamflows are forecasted near normal for spring and summer with the Lewis River at 98% and the Cowlitz at 85%. Precipitation has been below average for December at 24% and for the water year at 71%. The cold dry weather has also reduced the areas streamflow with the Cowlitz reporting 37% of average flow for December with temperatures eight degrees below normal.

For more information contact your local Soil Conservation Service office.



# COWLITZ - LEWIS RIVER BASINS

## STREAMFLOW FORECASTS

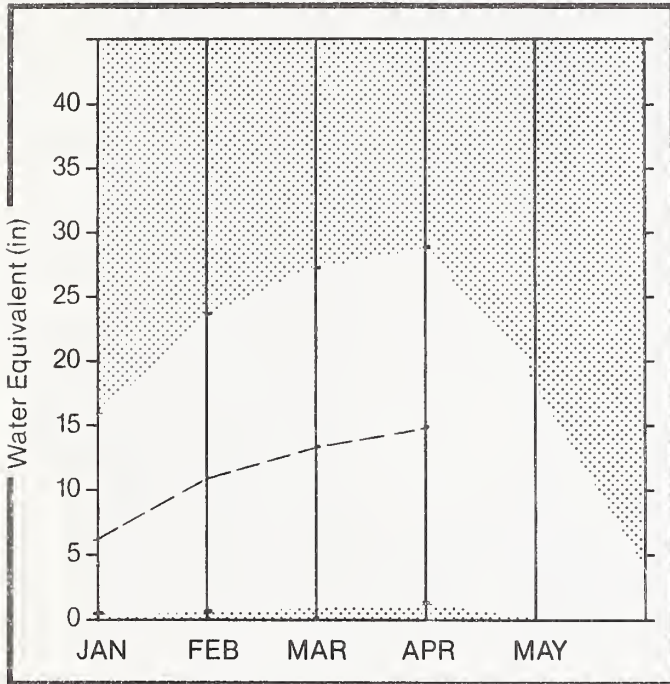
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
LEWIS RIVER at Ariel *	APR-SEP	1249.0	1230.0	98.0	140.5	54.4				
	APR-JUL	1086.0	1060.0	97.0	139.6	55.6				
	APR-JUN	961.0	940.0	97.0	139.9	55.8				
COWLITZ R. b1 Mayfield Dam *	APR-SEP	2038.0	1740.0	85.0	130.4	40.4				
	APR-JUL	1778.0	1520.0	85.0	130.5	40.5				
	APR-JUN	1502.0	1280.0	85.0	130.2	40.2				
COWLITZ R. at Castle Rock *	APR-SEP	2673.0	2310.0	86.0	111.4	61.4				
	APR-JUL	2323.0	2010.0	86.0	111.5	61.5				
	APR-JUN	1980.0	1720.0	86.0	111.9	61.9				

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF	
		THIS YEAR	LAST YEAR	AVE.			LAST YR.	AVERAGE
					Cowlitz River	1	48	60
					Lewis River	2	39	69

\*Corrected for upstream diversions or changes in reservoir storage.  
Average is for 1961-80 period.

# WHITE - GREEN

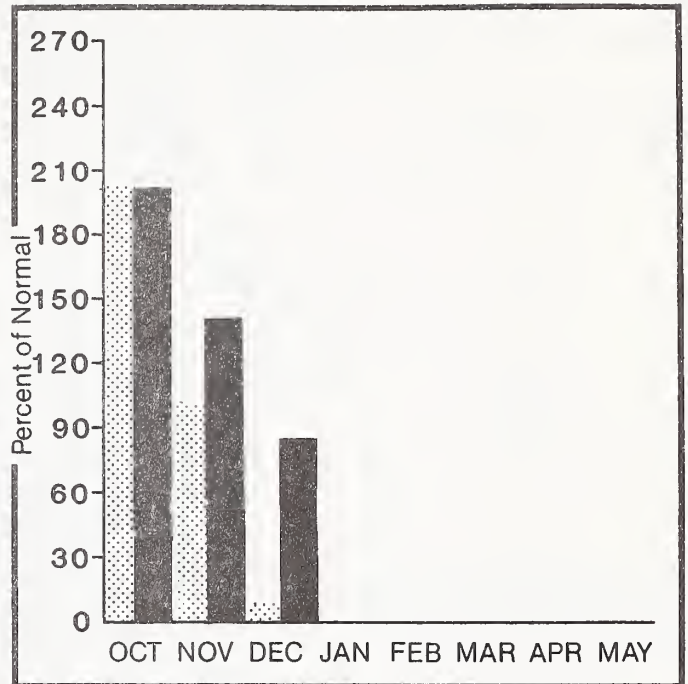
Mountain snowpack\* (inches)





\*Based on selected stations

Maximum  Average   
 Minimum  Current 

Precipitation\* (percent of normal)



\*Based on selected stations

Monthly precipitation  Year to date precipitation 

## WHITE - GREEN RIVER BASINS

### WATER SUPPLY OUTLOOK:

Summer stream flows are forecasted to be near average with the Green River at 88%. Water year precipitation has been at 85% of normal, with December at 21% November at 101%. Snowpack is at 70% of average with nine snowcourses reporting. Area streamflow for December was near 40% of average.

For more information contact your local Soil Conservation Service office.

# WHITE - GREEN RIVER BASINS

## STREAMFLOW FORECASTS

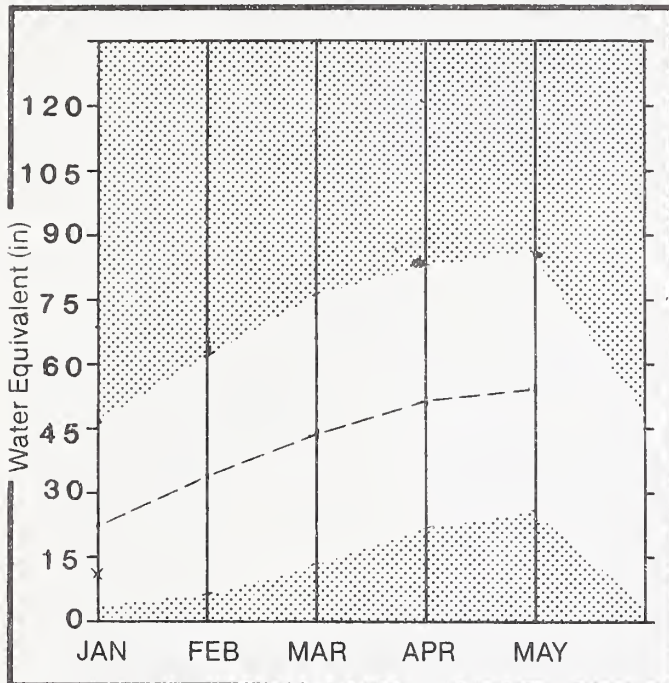
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
GREEN RIVER bl Howard Hanson Dam *	APR-SEP	316.0	252.0	79.0	79.7	79.7				
	APR-JUL	284.0	227.0	79.0	79.9	79.9				
	APR-JUN	256.0	204.0	79.0	79.7	79.7				
CEDAR RIVER nr Cedar Falls	APR-SEP	93.0	83.0	89.0	89.2	89.2				

RESERVOIR STORAGE (1000AF)		WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED
		THIS YEAR	LAST YEAR	AVE.	
					White River
					Green River

\*Corrected for upstream diversions or changes in reservoir storage.  
Average is for 1961-80 period.

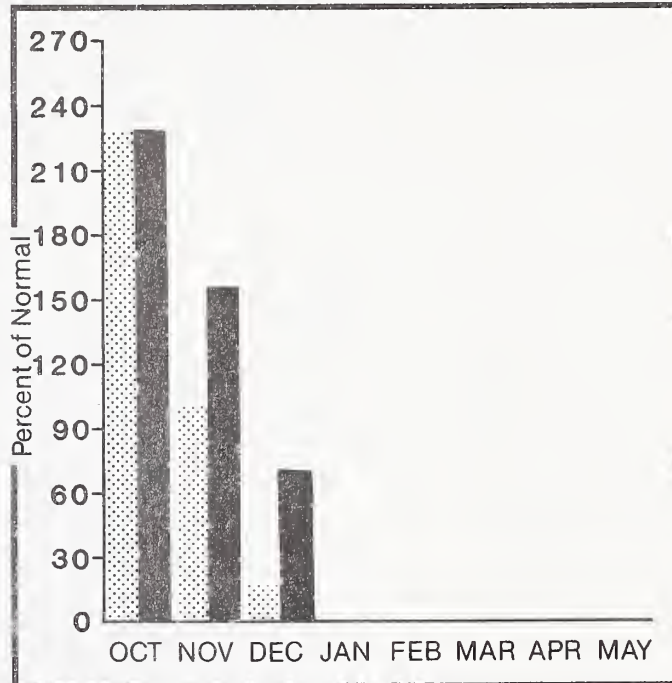
# NORTH PUGET SOUND

Mountain snowpack\* (inches)



\*Based on selected stations

Precipitation\* (percent of normal)



\*Based on selected stations

Maximum  Average   
Minimum  Current 

Monthly precipitation  Year to date precipitation 

## NORTH PUGET SOUND RIVER BASINS

### WATER SUPPLY OUTLOOK:

Snow cover in the North Puget Basins is below the 1961-1980 average, with Baker River at 52% and Skagit River at 78%. December temperatures averaged five degrees below average for December. Precipitation for December was 14% of normal bringing the water year total to 96% of average. Reservoir storage is below normal at 25%. Streamflows in the Skykomish River were at 25% of normal for December. Forecasted streamflow for area rivers is for near normal runoff for spring and summer with the Skagit at 85%.

For more information contact your local Soil Conservation Service office.



# NORTH PUGET SOUND RIVER BASINS

## STREAMFLOW FORECASTS

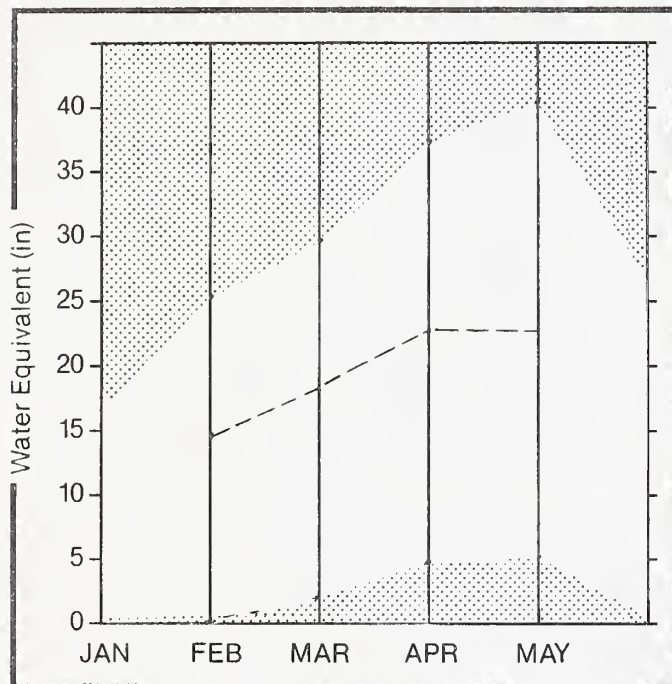
FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SKAGIT RIVER at Newhalem *	APR-SEP	2356.0	2000.0	84.0	110.9	58.9				
	APR-JUL	1972.0	1670.0	84.0	110.7	58.7				
	APR-JUN	1485.0	1260.0	84.0	110.8	58.9				

RESERVOIR STORAGE (1000AF)					WATERSHED SNOWPACK ANALYSIS		
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **	THIS YEAR	LAST YEAR	WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR. AVERAGE
ROSS	1404.1	1076.0	1083.7	---	Skagit River	3	55
DIABLO RESERVOIR	90.6	84.8	83.5	---	Baker River	8	32
GORGE RESERVOIR	9.8	7.6	7.9	---	Cedar River	0	0
					Snoqualmie River	0	0
					Skykomish River	2	43





\*Corrected for upstream diversions or changes in reservoir storage.  
Average is for 1961-80 period.

# OLYMPIC

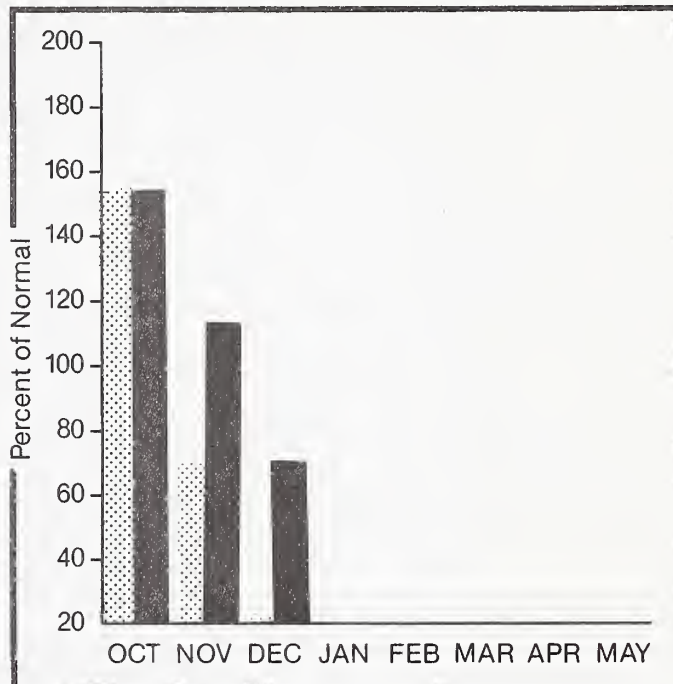
Mountain snowpack\* (inches)





\*Based on selected stations

Maximum  Average   
 Minimum  Current 

Precipitation\* (percent of normal)



\*Based on selected stations

Monthly precipitation  Year to date precipitation 

## OLYMPIC PENINSULA RIVER BASINS

### WATER SUPPLY OUTLOOK:

Precipitation for December has been below average at 19% for the Olympic Basins. Water year precipitation is at 70% of normal. Snow cover is estimated to be near 90% with only Carrol Pass snow pillow for data. December temperatures were three degrees below normal. Area streamflows were below normal for December due to the cold dry weather. Streamflows for the coming months are expected to be below normal with flows of 75%.

For more information contact your local Soil Conservation Service office.

# OLYMPIC PENINSULA RIVER BASINS

## STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
DUNGENESS RIVER nr Sequim	APR-SEP	160.0	120.0	75.0	75.0	75.0				
	APR-JUL	130.0	98.0	75.0	75.4	75.4				
	APR-JUN	97.0	73.0	75.0	75.3	75.3				
ELWHA RIVER nr Port Angeles	APR-SEP	553.0	415.0	75.0	75.0	75.0				
	APR-JUL	454.0	340.0	74.0	74.9	74.9				

RESERVOIR STORAGE		(1000AF)	WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **	WATERSHED	NO. COURSES AVE.0	THIS YEAR AS % OF	
	THIS YEAR	LAST YEAR AVE.			LAST YR.	AVERAGE
			Dungeness River	0	0	0
			Morse Creek	0	0	0
			Elwha River	0	0	0

\*Corrected for upstream diversions or changes in reservoir storage.  
Average is for 1961-80 period.

# The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

<b>Canada:</b>	Ministry of the Environment, Water Investigations Branch, Victoria, British Columbia
<b>States:</b>	Washington State Department of Ecology Washington State Department of Natural Resources
<b>Federal:</b>	Department of the Army Corps of Engineers U.S. Department of Agriculture Forest Service U.S. Department of Commerce NOAA, National Weather Service U.S. Department of the Interior Bonneville Power Administration Bureau of Reclamation Geological Survey National Park Service
<b>Local:</b>	City of Tacoma City of Seattle Chelan County P.U.D. Pacific Power and Light Company Puget Sound Power and Light Company Washington Water Power Company Snohomish County P.U.D.
<b>Private:</b>	Okanogan Irrigation District Wenatchee Heights Irrigation District Newman Lake Homeowners Association

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.



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